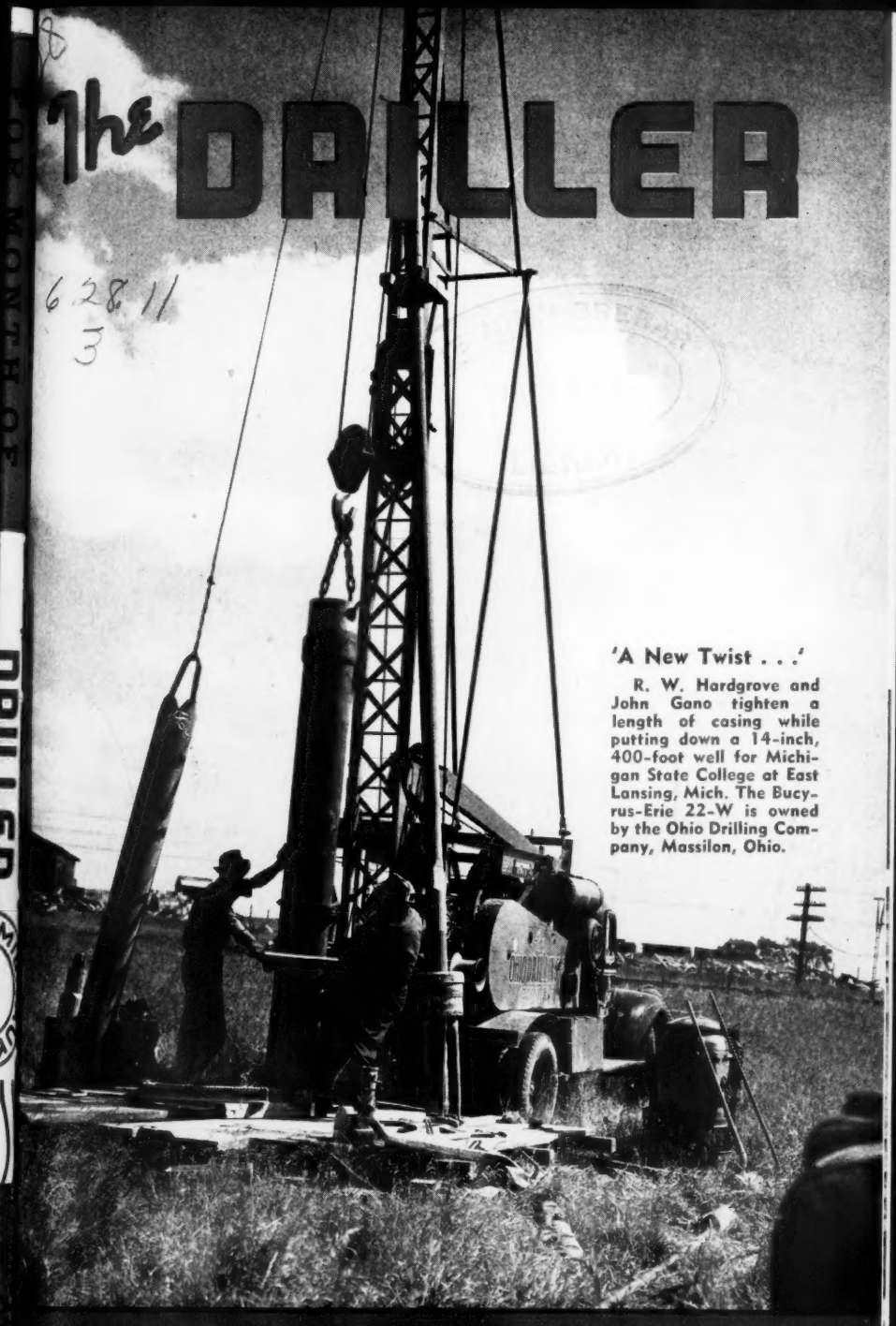
The DRILLER



'A New Twist . . .'

R. W. Hardgrove and John Gano tighten a length of casing while putting down a 14-inch, 400-foot well for Michigan State College at East Lansing, Mich. The Bucyrus-Erie 22-W is owned by the Ohio Drilling Company, Massilon, Ohio.

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DRILLER
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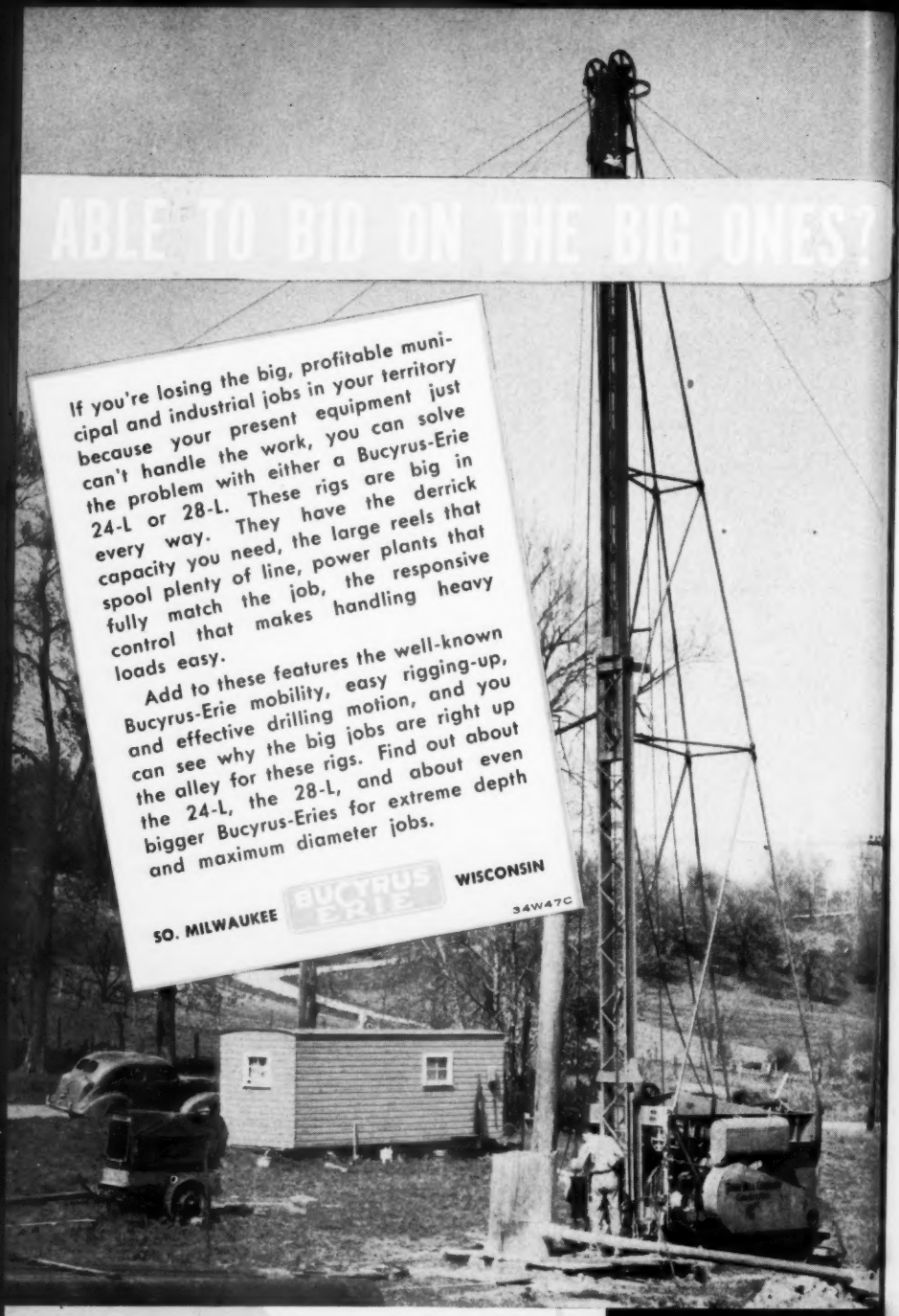
VOLUME 21 NOVEMBER, 1947 NUMBER 11


ABLE TO BID ON THE BIG ONES?
If you're losing the big, profitable municipal and industrial jobs in your territory because your present equipment just can't handle the work, you can solve the problem with either a Bucyrus-Erie 24-L or 28-L. These rigs are big in every way. They have the derrick capacity you need, the large reels that spool plenty of line, power plants that fully match the job, the responsive control that makes handling heavy loads easy.
Add to these features the well-known Bucyrus-Erie mobility, easy rigging-up, and effective drilling motion, and you can see why the big jobs are right up the alley for these rigs. Find out about the 24-L, the 28-L, and about even bigger Bucyrus-Eries for extreme depth and maximum diameter jobs.
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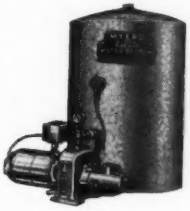
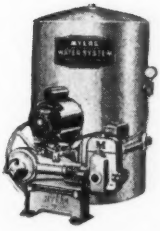
- Farm modernization and suburban building on the increase
- Farmer's income guaranteed at high level — with buying active
- Myers line complete—leads in quality—enjoys greatest public acceptance
- Myers builds factory addition to expand production facilities
- Myers increases and intensifies national magazine advertising for 1948
- Myers offers most complete program of Dealer Aid Material and ideas



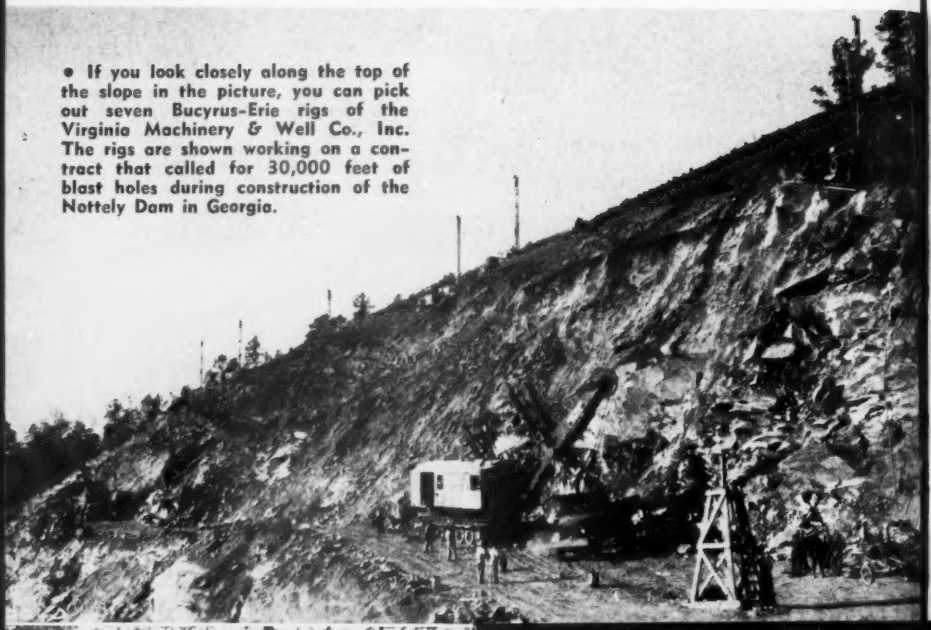
A MESSAGE TO MYERS DEALERS —

These established sales factors point to a greater opportunity in 1948 for well drillers who sell Myers Water Systems. As a Myers dealer you have the security and knowledge that Myers expanded production facilities, intensified national advertising, and aggressive merchandising will increase your sales and profits. And each Myers you install is another link in the solid chain of satisfied customers who will recommend your complete service to their friends.



THE F. E. MYERS & BRO. CO.

Dept. M-29, Ashland, Ohio



• If you look closely along the top of the slope in the picture, you can pick out seven Bucyrus-Erie rigs of the Virginia Machinery & Well Co., Inc. The rigs are shown working on a contract that called for 30,000 feet of blast holes during construction of the Nottely Dam in Georgia.

THE far-flung drilling activities of the Virginia Machinery & Well Company, Inc., Richmond, Virginia, have spread the well-earned reputation of this enterprising concern over a large portion of the eastern and southern states. Clients from New York to Florida and from as far west as Missouri can attest to the work of the Virginia firm—which

• The area around Richmond, Va., is not the best in the world for getting good wells at short depths. The eight-inch hole being put down by the Bucyrus-Erie 22-W in the picture was down to 800 feet and there was still no sign of water.

gives you an idea of the scope of its drilling operations.

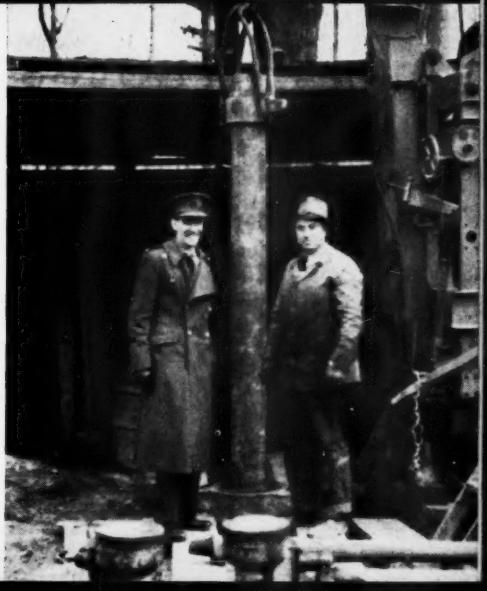
Founded in 1915 by Charles F. Cole of Richmond, president, the company started with the purchase of one steam rig and began expanding immediately. More rigs were added one after another until by 1920 the company was operating approximately ten rigs in the southeastern states with Richmond as the home base.

At the peak of its expansion, which occurred in the years of 1940-41-42, the firm had 19 rigs scattered throughout its large territory. Since this high point, the company has let some of its rigs go because of the difficulty of securing competent operators who can assume the responsibility of working many miles away from the home office. Present field personnel now includes 15 men who handle the six Bucyrus-Erie rigs the firm still operates. They have two 33-Ws, two 22-Ws, and two 24-Ls.

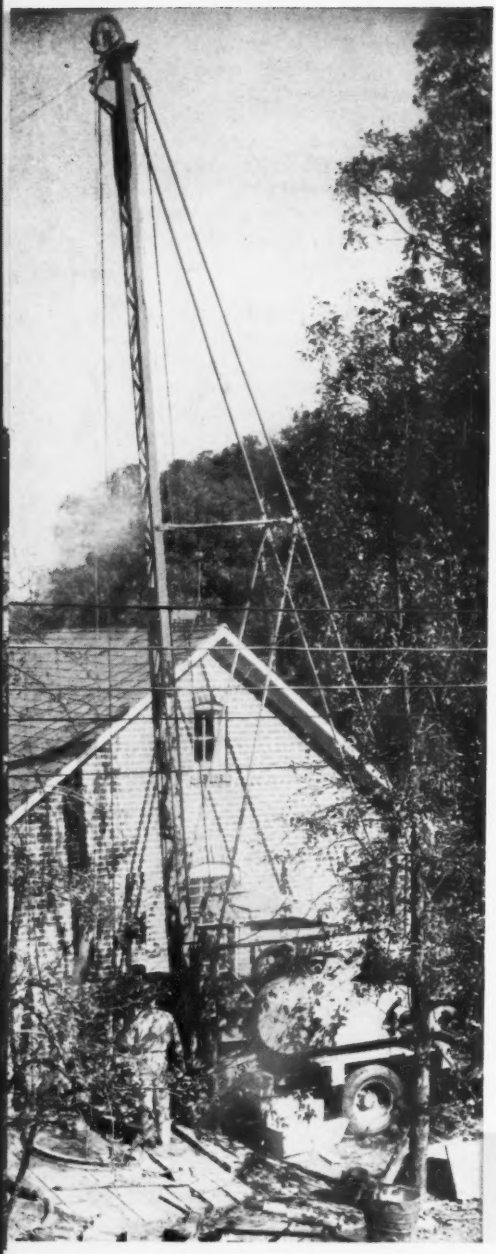
Besides being well-known throughout the East and South as outstanding well drilling contractors, the Virginia Machinery & Well Co., Inc., of Richmond, Va., is locally known for its wholesale business, retailing a complete line of plumbing and heating fixtures, engines, boilers, and pumping systems.

During the course of its career, the firm has put down almost all types of wells besides the ordinary farm and home wells. Types include blast holes, salt wells, prospecting holes, foundation holes, and holes under water for dock piling. However, the Virginia company specializes in municipal, industrial and government work, and a list of the big jobs that they have completed for various manufacturers would read like the "Who's Who" of southern and eastern industries.

Their largest producing well was put down for the American Agricultural Chemical Company in Brews-



• Before the British government purchased water well drills in 1943, they sent representatives into the field to get actual first-hand information about various rigs. It was no more than natural that the Virginia company should be visited. Here is Major M. M. Snow of the British Military Mission on Purchasing talking things over with C. C. Hildebrand at a well site in Yorktown, Va.



ter, Florida, in 1926. It was 30 inches in diameter to a hundred feet and then tapered to 18 inches the rest of the way down, finishing at 850 feet. A deep well turbine pump with a 250 h.p. motor was installed which pumped 8,000 gpm or 480,000 gallons per hour.

One of the deepest wells drilled was a 16-inch hole that went down 1,260 feet. This well was drilled for the Florida Public Service Company, Lake Wales. Two holes even deeper were put down in the mountains in southwestern Virginia. The holes started at 20-inches in diameter and went down to a depth of 1,650 feet. They were put down for a large chemical company.

Use Large Bits

When special work calls for special techniques, the firm readily accepts the challenge. While putting down holes for anchoring concrete piles, during the construction of the municipal wharves at Richmond, the firm learned that specifications indicated that the holes were to be 36-inches in diameter. So some of the largest solid rock drilling bits ever made in this country were ordered and successfully used on the job. Rigs had to be mounted on barges to put down a number of the holes.

According to J. G. Perry, secretary of the company, the boys on the rigs have met just about every formation imaginable in their work, including quicksand and Catoctin greenstone. This latter formation is a volcanic rock which is found on the east side of the Blue Ridge Mountains, and it is just about the hardest strata to drill into that can be encountered

(Continued on page 19)

• Distance presents no barrier to the traveling Virginians. Here one of their rigs is shown putting down a well on the outskirts of Atlanta, Ga.

The Driller & The Law

Some States Can Specify Well Equipment

Statutes governing public contracts show great variance throughout the United States, and the court decisions handed down in one state do not necessarily apply in others. However, the New Jersey supreme court decision here reported will be of interest to drillers as illustrating a typical problem.

SPECIAL circumstances under which a New Jersey municipality may closely specify the type of well and equipment that is to be installed by a contractor without violating a legal requirement for competitive bidding were stated by the New Jersey Supreme Court in an important decision rendered May 1, 1947. (Fisher v. Borough of Longport, 53 Atl. 2d. 210.) The decision was rendered in favor of the Borough when three citizen-taxpayers were defeated in an attempt to block a contract awarded to the only bidder for the job, Layne-New York Company, Inc.

According to the court, the Borough was "in need of a well and pumping system for the supply of pure and sufficient, economical, potable water." In advertising for bids, officials included the following clause in the specifications: "1. Work to be done: The work to be done includes the construction of a Gravel Filter well unit, *Layne-type or equal*, complete with pumping equipment and auxiliary engine drive having a guaranteed minimum capacity of not less than 700 GPM against a surface pressure of not in excess of 25 feet, all as hereinafter specified."

In its decision, the court declared, "It would seem that a careful reading of the . . . .specifications does not preclude competitive bidding so as to bar any bid except that of the defendant Layne-New York Co., Inc. Albeit the specifications call for a 'Layne-type' gravel filter unit, provision is therein made for other types of equipment by the use of the words 'or equal'. To hold otherwise would be to do violence to plain and simple English."

Necessities Granted

The court recognized that practical necessities justified use of the above-quoted specifications, saying: "The Borough . . . is entirely surrounded by salt water. The fresh water-bearing stratum is located at an approximate depth of 800 feet . . . The fresh water wells in this area . . . draw their water supply from this formation. If seriously polluted and unfit for human consumption, the only possible alternative supply would be to purchase water or drill down into the Raritan formation . . . over 3,000 feet below the surface . . . and the quality of which (water) has not been determined It is thus seen that the governing body was faced with a very serious situation and was, perforce, obliged to award the contract in question to a recognized reputable company, experienced in the construction of the type of well in question. . . . It appears from the evidence submitted that the Layne-New York Company, Inc., has had

(Continued on page 14)

This article on dressing drill bits by the hand forge method will be of interest to all drillers who swing their own sledges out in the field or in the shops. The information detailed here is designed to help solve your own particular problems that may be keeping you from getting the most out of your bit.

GENERALLY, the process of dressing drill bits by the hand forge method includes these steps: (1) heating to temperatures which make the bit steel plastic enough to be worked; (2) forging the steel to shape; (3) reheating for hardening, and (4) quenching. The results for which the man dressing bits strives are sharpness of the bit, hardness in the bit's crushing face and wearing surfaces, and toughness in the body section so that it will not crack in operation. Satisfactory results such as these depend on correct practices in each of the steps of the dressing process. Incorrect procedure, on the other hand, may result in bit troubles which are costly in equipment, time, and drilling efficiency.

This article, in addition to making suggestions in regard to heating equipment, attempts to give the fundamentals of correct practice in all of the bit dressing steps. It should be remembered, however, that the practices outlined here can at best be only general; that specific circumstances—such as special kinds of steel in bits—call for modifications of the practices suggested and must be taken into account when bits are dressed. In general, however, the suggestions made here are practices which have been thoroughly proved in field service. If followed, they will probably do much to eliminate many troubles which have their origin in faulty bit dressing.

Correct practices in heating bits depend first of all on the kind of heating equipment used. The best coke forge furnace is one leaving an arch or hood over the top.

Hood Needed

The reason for having such a hood or cover over the fire is that it enables the fire to hold its heat and helps heat uniformity because of radiation. An open fire without a hood makes uniform heating of bits extremely difficult and by allowing air to strike the steel increases the possibility of adding another source of cracking the steel. If only an open forge is available, it should first be fitted with an arch or cover of fire brick before being used.

The inside dimensions of the forge furnace should be sufficiently large to permit heating of bits without burning them by direct contact with a crowded flame. It's advisable, too, to have a deep fire pot in order to prevent holes burning through the fuel bed, and to avoid having an air blast strike the bit steel. A depth of from 7 to 10 inches should be provided for a fuel bed between the drill bit and the pipe where the air blast enters.

After heating equipment is prop-

erly arranged for convenient and quick handling, heating the bits for forging may be undertaken. This step is one in which extreme care must be exercised, for improper heating of bits prior to forging will damage the steel, whether the bits are subsequently sharpened by hand or by machine.

First of all, the practice of using mud or wet ashes to block off the part of the bit which is not intended to be forged is detrimental because it increases the possibility of crosswise cracking of the bit steel. The sudden difference in heat between the blocked-off portion of the bit and the heated part causes such cracking. However, pieces of dry fire-brick may safely be used to check the fire under the part of the bit which is not intended to be forged.

Heat Slowly

If bits are extremely cold they should first be warmed by laying them in the furnace without any forced flame. All bits should be allowed to absorb heat slowly until they show a red color (temperature about 1000°F.) in a dark room* (or temperature 1100°F. in daylight), after which they can be brought to forging temperature with a somewhat stronger heat. Special care should be taken to heat slowly during the first 400 to 600 degrees (the steel will still be black) when cracking most commonly develops.

The minimum time for bringing a 6-inch bit to forging temperature should be about 25 minutes, and during this time the bit should be turned frequently to prevent heating one side more than the other. If a drill bit is heated to a red color on one side while the other is allowed to remain relatively cold, the uneven expansion will cause stresses and cracks may develop.

For forging, the bit should be heated until the bit face shows a color changing from red to yellow on the first forging heat. The temperature at which this color occurs will vary with different types of steel. However, while temperatures vary with steels, the colors are comparable and may be relied on in determining correct forging heat. Forging may be done as long as the steel retains its bright red color, but should be discontinued when the steel has cooled to a dark red. If the desired shape has not been attained, the bit should then be reheated.

Avoid Overheating

Color used in forging bits is only an indicator, used to indicate the plasticity of the steel. Experience with the plasticity therefore determines your color range to indicate the proper forging temperature. At the right temperature, the bit steel is plastic enough to permit easy driving or "flow." If the temperature is too hot, the steel will approach a more nearly liquid or "soupy" state; if the temperature is too low, the steel will be too rigid, making forging extremely difficult. Avoid overheating because it causes grain growth and cracking; do not underheat because it wastes work, and don't be afraid to take as many reheats as may be necessary to arrive at the correct size and shape because the extra time for sharpening will be repaid in faster and safer drilling.

Several heatings may be required

(Continued on page 21)

***The colors mentioned in this article are those which normally would appear in heated steel in a comparatively dark room, or outside on a cloudy day. It should be remembered that bright light (electric or sun) will affect the appearance of the colors. Thus, what would be cherry-red color in the steel in a relatively dark room, could appear as black under intense electric or sun light, and so on. It is therefore essential to shield the bit from light in reading the colors.**

The DRILLER

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Why Not Apply "Bailer Test" To Labor Law?

ALTHOUGH the current shortages in the well drilling industry are raising hob with a lot of water well drillers, this situation can't but drive home to each driller the fact that his individual success is closely tied-up with the welfare of related industries that supply him with tools and equipment. In such an integrated and highly specialized economy as ours, we are all in some way dependent upon the other fellow for our livelihood.

That's why the present controversy regarding the Taft-Hartley law has a direct bearing on each one of us. Labor and management must cooperate to preserve our free society, our democratic system. We'd like to step into the breach and make a suggestion that all persons use a little of the well driller's procedure. Before an experienced driller gives an answer on the type of formation he is drilling, he hauls up a bailerful of cuttings and gives them a careful examination. He bases his answer on his findings.

Poll Results

It appears that a lot of us should run a "bailer test" on the Taft-Hartley Act. In a recent independent public survey, all of the employees questioned approved of every major provision of the bill by percentages ranging from 60% to 86%; union members also approved all provisions except one—the article outlawing closed shops, which was approved by 48 out of 100 union members. Yet, when questioned on the bill as a whole, 54% of all employees and 64% of union members "disapproved of the law!

This would indicate that many people are opposed to the law merely because they were told that it was bad, rather than the fact that they had carefully examined the law and found it wanting. Before blindly accepting the decision of others, we should do a little investigating ourselves.

There are many people who believe the future of our country rests to a large degree on our maintaining a strong, workable labor relations act— one which really protects the worker, the employer and the public. We believe the Taft-Hartley Act is such a law. We believe every American should take a keen interest in this law—and urge those working with and for him to do like wise. If we can accomplish this educational problem, we can be sure our economic freedom will endure.

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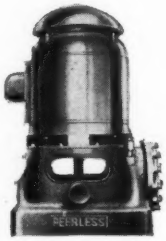

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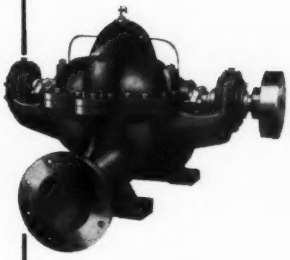
General Specifications: *Capacities,* from 15 to 30,000 g.p.m.; *Lifts,* to 1000 feet; *Drives,* electric, gear, belt or combinations. For wells 4" inside diameter and larger. Embodies patented Double-Bearing and Double-Seal Bowl construction.



PEERLESS TYPE A CENTRIFUGAL PUMP

General Specifications: Capacities, from 50 to 70,000 g.p.m.; *Heads,* 15 to 300 feet; *Sizes,* 2" to 42" discharge; *Drives,* electric and other types from 1 to 1000 h.p.; *Type,* single stage, double suction, split-case, ball bearing. REQUEST DESCRIPTIVE BULLETIN.

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NEWS OF THE MONTH

Jersey Drillers Discuss Law

APPROXIMATELY 140 well drillers and operators attended the New Jersey Well Contractor's Association's meeting held in New Brunswick, N. J., on September 11, to discuss the license law recently passed by the state of New Jersey.

Several state officials plus the Executive Board of the association were on hand to explain different provisions of the bill. Some of the bill's features include $10 license fees for master drillers (drillers with ten year's experience), $5 license fees for genuine drillers (drillers with five year's experience), and the securing of permits for well construction. At present this calls for the issuance of a permit only on wells of 100 feet or more in depth.

Second Convention Held By Tarheels In Hickory, N.C.

A LARGE attendance marked the second annual convention of the North Carolina Well Drillers Association held in Hickory, N. C., October 17 and 18 at Hotel Hickory.

After the morning registration period of the first day, the noon meeting featured an open forum discussion on "Steel Pipe—The Product and its Availability." The discussion was led by H. L. Bialock. The evening luncheon was followed by a talk by J. F. Bennett, Washington, D. C. who accompanied his talk with the presentation of a film on the the manufacture of cable. Guest speaker was R. L. Patton, Superintendent of Education, Burke County, Morganton, N. C.

A luncheon highlighted the second day's afternoon session. A talk on well drilling problems was delivered by E. E. Van Every, Larkin & Co., Butler, Pa. He was followed by Guest Speaker Rev. Arthur J. Lynn, Hickory, whose address was "Christianity and Democracy in Business." A business meeting of the association was held immediately after the luncheon program. A banquet in the evening closed the convention. Guest speaker was R. R. Storm, Urbana, Ill.

Report States Eastern Levels Suffer Decline

WATER levels in observation wells throughout the nation varied only slightly from the preceding month according to the August bulletin recently released by the U. S. Geological Survey.

Attention was focused on the West where drought conditions had placed great demands on underground water reserves for irrigational purposes. Precipitation during August in California, New Mexico, and Arizona helped relieve the situation somewhat, but reserves are so depleted that many months of excess rainfall will be required to break drought conditions in New Mexico and Arizona. Because the critical period of the irrigation season is past in California, ground-water reserves are expected to halt their decline.

Test well observations along the Eastern Coast showed about the same picture for August as July—water

levels generally below normal. According to the bulletin, water levels in wells in Atlantic City, N. J., and Ocean City, N. J., tapping the 800-foot sand, were about four feet lower than they were last year at the same time. On August 21 the water level in the Longport well was 57 feet below mean sea level, a record low for this well. The Ocean City well was also at a record low of 64 feet below the measuring point. It should be noted that both of these wells are unused and are some distance from pumped wells. The pumping levels in both communities are thought to be well below the 100-foot mark and are lower than they have ever been before.

Levels in the Southern states continued to be on an above normal plane.

N. Y. Group Meets

THE regularly scheduled meeting of the Empire State Water Well Driller's Association was held at the Langwell Hotel, Elmira, N. Y., on October 15. Proposed legislation relating to ground water problems in the state of New York were discussed by the drillers attending the gathering. Representatives of two well equipment manufacturers also addressed the meeting.

Cable Discussed

AN article based on the question "How large should be the diameter of the sheave or drum for my wire rope?" features the latest issue of "Rope-ol'ogy" published by Macwhyte Company of Kenosha, Wis. Shown with the article is a chart giving usual sheave and drum sizes on various wire rope applications.

Also included in this issue of the bulletin is the announcement of "Socketype" cable terminals now being manufactured by the company. Other articles pertaining to the uses of wire rope and job pictures complete the issue.

Portable Unit Threads Pipes

A portable power pipe threading machine for use in completing plumbing installations for old and new construction has been announced by the American Die & Tool Co., Inc., of Reading, Pa. The new model, named Red-E-Haul, is designed especially for installation and maintenance of all piping from ½" to 2" sizes. This range can be extended to all sizes from ⅛" to 12" by use of simple auxiliary equipment. Powered by a 1 h.p. motor, the unit may be used for cutting, chamfering, reaming, and threading.

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BELLE MEAD, N. J.

States Specify . . .

(Continued from page 7)

wide and successful experience in the construction of fresh water wells throughout New Jersey and particularly in the [area involved]."

A. L. H. Street

Western State Initiates Survey

A PROGRAM calling for a three-year statewide water survey to cost $500,000 has been approved (Sept. 5) by the California State Water Resources Board.

The state board adopted a preliminary budget under which $140,000 would be spent in the coming year and $180,000 in each of the succeeding years. The money has been earmarked for the board by the state.

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"The ultimate objective of the investigation," a statement released by the board said, "is to prepare a physical plan for the full practicable conservation, control, protection, and utilization of the water resources of the state, including the state's share of the waters of the Colorado River, both surface and underground. . ."

Halt In Decline Of Water Levels Noted In Wis.

ACCORDING to reports, the drop in the water levels in deep wells drilled in the Milwaukee, Wisconsin, area has halted due to the decrease in demand by large local industries. The former decline was brought on by the heavy pumping necessitated by 24-hour shifts during war production when many large companies either drilled new wells or increased their pumpage from older ones. Now most plants are no longer on a continuous shift schedule and other plants have ceased operations completely. This has cut down industrial water needs considerably.

Plenty of Water

The deep wells average around 1,400 feet in depth and get their water from a sandstone strata which outcrops in the central part of the state. There is no question about the lack of water supply in this formation, according to geologists, because plenty of water is evident. However, dropping well levels pose a serious economic problem. The some 112 deep wells in the county were estimated to have pumped approximately seven billion gallons of water during 1946. Should the levels have continued to decline, the cost of deepening the wells and resetting pumping equipment deeper

into the wells would have made these operations prohibitive in comparison to the results gained. Many communities would therefore be faced with a serious, perplexing problem.

Besides the afore-mentioned cut in industrial demand for water, another aid that is said to have helped the water situation is the 1945 law passed in the state which gives the state board of health the power to issue permits for all wells which pump more than 69 gallons per minute or approximately 100,000 gallons per day. To date, ten permits have been denied to prospective well owners. Others were given approval when the wells were considered to be unharmful to the existing supply and the owners were willing to protect against leakage from shallow well sources.

Shallow Wells Observed

The shallow well problem in the same area is still being studied. Because of the many new homes being constructed in subdivisions removed from the city water supply system, the number of wells being drilled on the outskirts of the metropolitan area has increased greatly. In many of these locations original well owners have reported a noticeable drop in well levels since their neighbors have drilled wells.

The drillers' association in the state has taken exception to many of the county reports that the shallow well level is dropping. Their claims seem to be substantiated by an official of the state board of health who recently was quoted as saying that the situation on the whole was improving. More information is being gathered by the geological survey and their report is being awaited with interest by all concerned.

For Fast, Profitable Drilling on blast holes or shallow wells, there's no equal for Macwhyte "Hi-Lastic." Specially made for the job, "Hi-Lastic" has just the right elasticity . . . allows tools to strike harder and faster, tools can be carried higher, allowing for longer strokes. "Hi-Lastic" keeps the bit turning on all types of formations and reduces chances of the hole getting out of round. Internally lubricated. No manila cracker required.

For Deep Wells, Macwhyte Standard Cable-Tool Lines have correct elasticity for making hole fast.

For Sand Lines, use Macwhyte (6x7) Mild Plow Steel.

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Authorized Macwhyte Distributors and Mill Depots throughout the U. S.

FROM THE MAILBAG

This page is open to any of our readers having questions to ask relating to drilling, driving pipe, dressing bits, etc. All letters will be answered promptly by experienced drillers and engineers who are qualified to give intelligent advice on these subjects. We will publish as many letters of general interest as space will permit. Address: The Driller, South Milwaukee, Wis.

Boulder-Laden Strata Is A Problem

Gentlemen:

We have a job of drilling a lot of 15" holes in loose, gravelly, dry ground containing a lot of big boulders. These holes have to be straight, and the boulders have been giving us a good deal of trouble.

We would like to have any suggestions you have to offer on the type of bits to use, especially for drilling off the side of the boulders which project into the side of the hole, without losing our alignment.

H. B. D.

Louisville, Ky.

In drilling gravelly ground containing big boulders you have a problem that has been encountered by many a contractor but to the best of our knowledge no concrete method of successfully coping with it has ever been worked out. The strategy most commonly employed appears to be to "worry the hole down."

It appears to us that you have a job to do of such magnitude that you would be justified in spending some time in working out a practical approach. Very likely the reason this has not been done before is because most contractors only occasionally drill in such formations.

It occurs to us that the drilling of a straight hole, under conditions such as you mention, could best be accomplished by employing a full stocked Mother Hubbard type of rock bit, dressed with a reaming edge of at least 80% and a concave face with the reaming edges extended beyond the cutting or penetrating edge.

In other words, the bottom of the bit should somewhat resemble that of a properly sharpened round reamer. It would also be our suggestion that the wearing surfaces of the drilling bit be built-up with coarse grain barium. It would, of course, have to be put on with a torch; also, that about a 4" ring of barium be built-up on the top of the bit blade just under the wrench square. This upper reaming ring should be built up to almost the same gauge as the wearing surface and spiral shaped gaps should be left in the reaming ring so that the cuttings could by-pass, thereby, not too drastically retarding the fall of the tools. Barium is very abrasive and we believe would go a long way towards keeping the hole straight and to gauge.

We think that an absolute requisite for satisfactory drilling of dry gravel would be to use Aquagel freely regardless of the type of tools employed. This would have a tendency to seal up the wall of the hole and hold the smaller boulders in place and greatly reduce the possibility of caving. It would also help considerably in retaining water in the hole for drilling.

The above ideas may not prove practical but it appears to us that you are up against a problem that can only be satisfactorily solved by experimenting and the above is something we would try if we were in your place.

Fairbanks-Morse Pomona Vertical Turbine Pumps: Oil or water lubricated, with open or closed impellers—you can "figure" the right one for you.
Fairbanks-Morse Centrifugals: The broadest line, for widest variety of centrifugal pumping service.
How Do You "Figure" a Pump?...
"Figuring" a pump is engineer-talk for the slide-rule work necessary before deciding on the type and size of pump required to do the job at hand.
It's not easy: it involves the skilled use of almost every hydraulic formula. Equally important, it demands a familiarity with pumps and pumping problems that is broad enough to prevent oversight, deep enough to assure an answer that's right.
Before you "figure" your pumps, have a talk with your Fairbanks-Morse dealer or the pump engineer from your Fairbanks-Morse branch office. If there's a way for you to save money and gain real pumping satisfaction, they'll know how to "figure" it.
Westco Turbine Pumps: Built with extreme accuracy for high-head pumping of almost every liquid.
FAIRBANKS-MORSE
A name worth remembering
DIESEL LOCOMOTIVES • DIESEL ENGINES • PUMPS • SCALES • MOTORS • GENERATORS
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WIT BITS

Shnotinsotski, a Russian, returned to Russia after a year in the United States. He met a friend soon after his arrival and lost no time in telling him about the wonders of America.

"Sasha, it's nice in Russia, bot you should see it in America. Dare you ride everyware in ah limousine. It cost nattin'! Dare you itt at de bast hotel. It cost nattin'! Dare you gat all kinds dimonds, fuzz, jools. It cost nattin'! You stay in movvelous rooms, it costs nattin'!

"All dis heppened to you?" cried the open-mouthed Sasha.

"To me, no," replied Shnotinsotski, "but to my sister, yes.'

Barber: "Will you have something on your face when I finish?"

Customer: "Well, if you don't mind, you may leave my nose there."

"Will you have imported or domestic sardines on your sandwich?" asked the waitress of Sandy McStash.

"Whut's the difference?" asked Sandy.

"The domestic is a quarter, the imported thirty-five cents."

"I'll take the domestic, I'm payin' no sardine's passage across the ocean, my good woman," roared McStash.

Mrs. Fussy: "Are these chickens fresh?"

Butcher: "Fresh? Why, lady, if I had an iron lung I could revive 'em."

Suitor: "I wish to marry your daughter, sir."

Dad: "Do you drink, young man?"

Suitor: "Thanks, a lot, but let's settle this other thing first."

Mrs. Brown: Oh, doctor, it was nice of you to come way out here just to see me.

Doctor: Well, I have a patient next door, so I thought I'd just kill two birds with one stone!

Conductor: "May I have your ticket, please?"

Drunk: "Go buy yourself one like I did."

A guest at a banquet took pains to make himself agreeable to a Chinese who sat next to him. After the first course he asked, "Likee soupee?" There was no reply except a genial smile. After the next course he inquired, "Likee fishee?" This evoked an even brighter smile.

Later in the evening the visitor from the far East rose and delivered a speech in perfect English. On resuming his seat he turned to his neighbor and asked, "Likee speechee?"

A rather damaged-looking Scandinavian was seated in the gutter in front of a Northwestern saloon, laughing hilariously as the blood dripped from his nose.

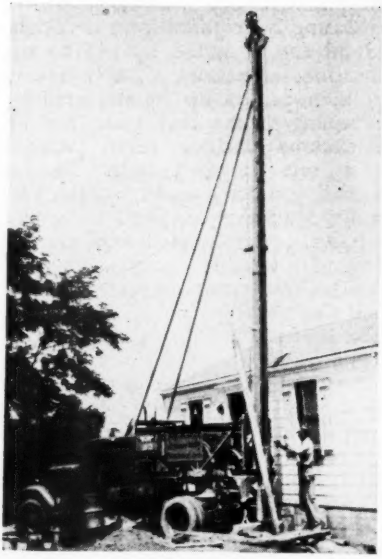
A passer-by stopped: "What's the joke?"

The wreck replied: "Aye bane in dar at da bar an' a feller come oop to me and hit me in day eye and say, 'Take dat, you dam Norvegian!' An' hay poonch me on da nose and say, 'Dat for yu, yu dam Norvegian!' An' hay kick me into street. Ha, ha!"

"Well, what's so funny about that?"

"Vy, aye bane Svede!"

The Winner!



• After two six-inch diameter holes had been drilled to a depth of 274 feet on this location, the Steubenville Pump & Drilling Company of Steubenville, Ohio, moved in on the job with their Bucyrus-Erie 21-W and put down a successful eight-inch well to a depth of 110 feet. A veteran water and oil well driller, Harry Chambers, Toronto, Ohio, handled the rig and completed the job in 11 hours.

Virginians . . .

(Continued from page 6)

in their territory. While drilling in this rock, so the story goes, when a driller wants to know how much hole he has put down, he merely measures the bit to see how many inches have been worn off—and that answer gives him the number of inches he has put down!

The immediate area around Richmond itself is not as favorable as some territories for getting good wells. Granite wells put down here

Pump Handle Pete Says:

Drillers who know Jensens Are Ahead

Think back. Remember when some scrap of information picked up months ago helped you sell a job? After all, the more you know about drilling and well equipment the better you can do your work.

When information on Jensens can help you — and it may be tomorrow — we hope you're prepared. We hope you know about Jensen's advantages of simplicity, dependability and economy.

Just in case you don't, invest in a penny post card today. Address it to us. By return mail you'll get information that may mean more jobs and more money to you.

JENSEN
BROTHERS MFG. CO.
COFFEYVILLE, KANSAS, U. S. A.
EXPORT OFFICE, 50 Church St.
New York City

average about 500 feet in depth and a yield of 60 gpm would be considered average. Of course, difficult areas are to be expected by a firm that operates on such a large scale. The Virginians have traveled so widely that their reputation for workmanship is well known as far west as Rolla, Missouri, where they put down a well for the school of mines.

With rigs scattered in various parts of the country, Perry, who acts as field supervisor and contact man, is sometimes hard put to keep up with the drills. Occasionally as many as three or four weeks may elapse before Perry can visit the job, which means the drill operators are on their own most of the time. They usually work fifty to sixty hours a week, and because of the traveling time involved, they are also paid mileage rates. While bits are sharpened right on the job, the drillers can call on the Richmond office for any help needed, for fishing tools, and for other supplies.

Casing is freighted from the Richmond supply house by rail to rig locations or nearby points where it is then picked up by the drillers. Servicing trucks that work out of Richmond include three pickups and one large vehicle. Besides handling drilling operation, the Virginia Machinery & Well Company wholesales a complete line of plumbing and heating fixtures, engines, boilers, and pumping systems. They sell Cook turbine pumps and act as distributors for Myers water systems. What at first may seem unique to many drillers is the fact that the firm, while acting as a wholesaler, actually sells casing and supplies to its competitors. This does not seem so strange when you visit the two large warehouses in Richmond and realize the magnitude of their sales operations which now by far overshadow their drilling contracts. With main street frontage in one of the warehouses and railroad tracks adjacent to both warehouses, the company is in an enviable position to handle its large sales traffic.

Have Big Staff

On ready call at the office there are three mechanics whose main work is servicing water systems and pumps. The shipping department keeps six persons busy, while ten persons in the office, sales, and executive departments have their hands full seeing that all orders are given prompt attention. Besides the two warehouses, which are three stories high and equipped with electric elevators, the company has a pipe yard in South Richmond.

Though the company has an enenviable history and is well known, it continues to remind its customers of its work by advertising in both newspapers and circular letters.

Complete Coverage for Water Wells

•

2 to 40 inches diameter
3 to 10,000 gallons per minute
¼ to 600 H. P.

•

Our 5 Sales Divisions are:

Vertical Turbine Pumps
Well Strainers
Water Supply Systems
Water Well Supplies
Octagon Wood Pump Rod

A. D. Cook, Inc.

Lawrenceburg, Indiana
Write for Sales Literature Interested In.

Bit Dressing . . .

(Continued from page 9)

to forge the bit to correct shape, the number of such heatings depending on the size and condition of the bit, and on the skill of the operator. If the required modification is not great and the work is being done by an experienced blacksmith, as few as two forging heats may be sufficient to allow time for forging at the correct temperature. However, if the dressing job requires a great deal of hammering, it may be necessary to heat the bit three or more different times in order to make sure that forging is done at the proper heat.

Final Heat Applied

After the bit has been essentially dressed to shape and only the finishing touches of the dressing operation remain, the final or finishing heat is applied. Since only the surface steel must be moved in finishing the dressing operation, the temperature required on the finishing heat is not as hot as on previous heats. The steel at this stage should not be allowed to reach a yellow color, but should be instead finally forged when it is at about 1700° as evidenced by the cherry red color (not orange or yellow).

When the dressing operation has been entirely completed, the bit is ready to undergo the hardening process.

A bit should never be quenched directly from a forging heat because of the danger of cracking, and the undesirable structure obtained. Instead, the bit should be allowed to cool from the forging heat until it turns fully black (in the shade). After it has cooled completely, it should be heated uniformly to obtain a fine even grain in the steel. As in the case of heating for forging,

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A simple but ingenious oil ring lubricates it for a long period.

A wind governor regulates wheel speed regardless of wind velocity, from a zephyr to a stiff blow.

An automatic V-brake locks the wheel securely in a storm, even if the control wire snaps.

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Windmills

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EVANSVILLE • WISCONSIN

BRANCHES

BAKER MFG. CO.: Minneapolis, Minn.; Madison, Wis.; Fort Dodge, Ia.; Cedar Rapids, Ia.; Omaha, Neb.; Kansas City, Mo.; Enid, Okla.; Hutchinson, Kansas.

BAKER MFG. LTD.: Winnipeg, Canada.

AXTELL CO.: Fort Worth, Tex.; Amarillo, Tex.; Lubbock, Tex.; San Angelo, Tex.

the bit should be turned frequently when it is being reheated for hardening in order to prevent heating one side more than the other. The bit should be heated to just the temperature at which the magnetism leaves the steel, and then should be quenched immediately. This temperature (varying with the type of steel) is known as the non-magnetic stage or transformation point.

Magnet Used

The non-magnetic stage may be determined by using a small horseshoe magnet fastened to a stiff wire handle about two feet long in such a manner as to allow it to swing freely. By allowing the magnet to come into contact with the point of the bit, as the temperature of the bit increases, it will be possible to detect the point at which the bit point is no longer attracted by the magnet. This is the non-magnetic or transformation stage, and at this point the bit should be quenched immediately. Heating to temperatures above the non-magnetic point is dangerous because it will cause grain growth. This in turn may result in cracking during quenching or in a cracked bit developing in operation.

The bit should be heated to quenching temperature only as far back as it is to be hardened, for heating more of the stock back of the face than is necessary is one of the causes of cracking. Since hardness is desirable only in a bit's wearing surface and crushing face, heating should be confined to the pulverizing and reaming edges as much as possible.

In general, 6-inch bits should be reheated about 1½ inches back from the reaming edge. The figures for larger bits should be proportional or, roughly, 2 inches back of the reaming edge for 9-inch bits, 2¼ for 10-inch, and 2½ for 12-inch.

The next step in bit dressing is the quenching operation, which should be done, as related above, immediately after the bit has been reheated to the non-magnetic stage.

A half-barrel may be used as a quenching tub. The amount of water needed in the tub will vary with the depth at which the bit is to be quenched. The temperature of the quenching water for water well drilling bits should be between 50° and 75°F. Tap or well water is suitable.

The bit needs to be quenched only as deep as the hardness is required. However, quenching several inches deeper will not be detrimental provided that previous reheating for hardening was limited to the proper area. Thus, quenching a 6-inch bit to a depth of four inches or more will do no harm if it was correctly heated.

Bit Is Quenched

In quenching, the bit should be immersed in the quenching water in a vertical position. To facilitate this, a steel bar may be placed across the top of the quenching tub as a support to keep the bit vertical. Another possibility is placing a horizontal iron grate, on which to rest the bit, in the tub.

The length of time the bit should be left in the quenching water depends on the kind of steel in the bit, the number of bits being quenched, the size of the bit, and other variables. In general, however, the bit should be removed before it becomes stone cold, instead of being allowed to remain in the water for a very long period.

It is inadvisable to use oil for quenching for two reasons: First of all, the quenching rate of oil is so slow that the desired grain structure and hardness is not obtained. Second, oil is more difficult to obtain than water and has no advantage over it.

SOUND ADVICE FOR EVERY DRILLER...

● The shock load resisting action of U·S·S American TIGER BRAND *Mor-Spring* Wire Lines dampens out peak stresses which cause wire rope breakage. The extra spring built into these lines means greater "reach" and better action of drilling tools from top to bottom of the hole.

Developed especially for shallow hole oil, gas and water well drilling, MOR-SPRING wire lines are strong, tough, flexible. They help you get down faster—and stand up longer in this service. Distributors located in principal cities.

Immediate Delivery
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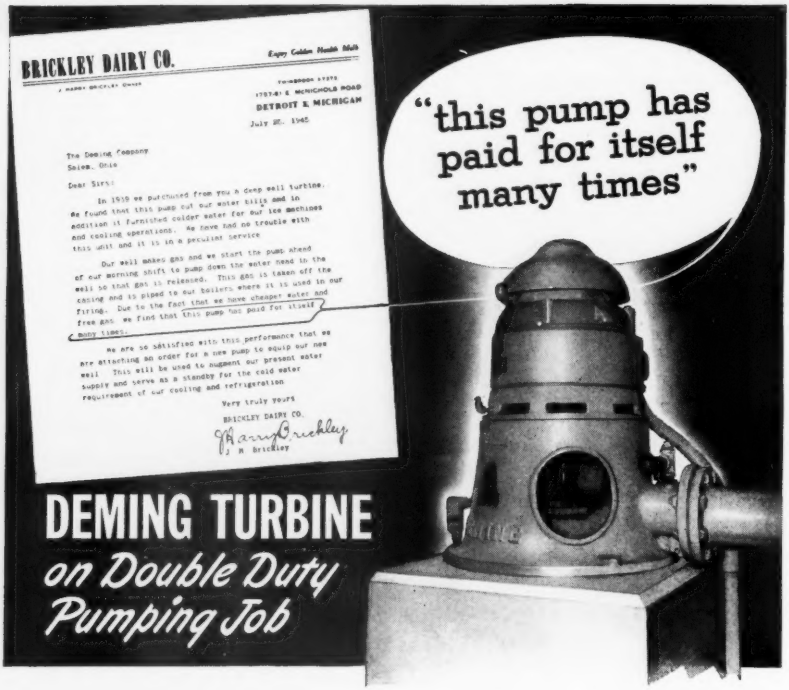
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In 1939 we purchased from you a deep well turbine. We found that this pump cut our water bills and in addition it furnished colder water for our ice machines and cooling operations. We have had no trouble with this unit and it is in a peculiar service
Our well makes gas and we start the pump ahead of our morning shift to pump down the water level in the well so that gas is released. This gas is taken off the casing and is piped to our boilers where it is used in our firing. Due to the fact that we have cheaper water and free gas we find that this pump has paid for itself many times.
We are so satisfied with this performance that we are attaching an order for a new pump to equip our new well. This will be used to augment our present water supply and serve as a standby for the cold water requirement of our cooling and refrigeration
Very truly yours
BRICKLEY DAIRY CO.
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DEMING TURBINE
on Double Duty
Pumping Job

Brickley Dairy Company of Detroit, Michigan is one of hundreds of owners of Deming Deep Well Turbine Pumps who are thoroughly pleased with their investment. The Deming Turbine Pump installed at Brickley Dairy does the "double-duty" job of pumping down the water head to release gas in the well for use in firing the boilers and pumping the necessary water supply for cooling, refrigeration and other plant operations. Well Drillers who install Deming Deep Well Turbine Pumps exclusively find that it is good business to "standardize" on the dependable Deming line and center the responsibility for high standards of pump construction in one reliable source—The Deming Company. If you are not familiar with the important features of Deming Deep Well Turbine Pumps, write for Bulletin 4700-8.

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All advertising in this section is payable in advance. Enclose your check or money order with copy. Rate: 30c per line. Minimum charge $1.20. No discounts; no commissions. Count your own copy to avoid delay. The average line contains 28 characters (20 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number if blind advertisement is desired. Closing date—10th of preceding month. Example — January issue closes December 10th. Be sure to address separate inquiries to each advertiser by using the correct box numbers. Mail Box inquiries care of THE DRILLER, South Milwaukee, Wis.

DRILLS FOR SALE

Star drilling machine with 33′ steel derrick and B-E shock. Working every day—but needs repairs. With or without tools for 4″, 5″, & 6″ holes. Mounted on semi-trailer with 27 Diamond T truck. Price $900 without, $1200 with tools. A. R. Touvell, 513 So. River St., Aurora, Illinois.

21-W drill mounted on 1937 Dodge 1½ ton truck with new cable but without tools. Machine in excellent condition. Write or phone Clarence Acker, 3934 South 41st Street, Milwaukee, Wisconsin. Phone MI 7435.

Sullivan Rotary No. 38, mounted on a D-40 International truck, all necessary tools including 400 ft. of 2⅜ drill pipe, three Hughes bits, five fishtails. 1200 ft. capacity and a sand reel has been added for water wells. All hydraulic controlled and in very good condition. $10,000 cash. Wilson Drilling Contractors, P. O. Box 136, Merrill, Oregon.

DRILLS FOR SALE

Practically new 21-W Bucyrus-Erie drill mounted on truck with 31′ derrick with rubber shock absorbers. Le Roi 4-cylinder gasoline engine. Free delivery. No tools. 500′ cables. Box 195.

Bucyrus-Erie 33-W drill, semi-trailer mounting. LeRoi gasoline engine. 36′ derrick with rubber shock absorbers. Good condition, located in the Milwaukee area. Box 194

BUSINESS FOR SALE

Includes all steel Howell rig with 36′ derrick, casing reel, 31 HP IHC motor nearly new; mounted on IHC 39 truck, new rear tires; 1 set 2¼″ API tools for 4″ and 4¼″ work, 1 new set 2⅝″ API for 5″ work (the stem has not arrived yet) 3 scows for sand and gravel work, 7″, 8″ & 6″; welding outfit, 2 chain hoists, electric drill and general shop tools. Also new 32x40′ shop on 120x280′ lot within city limits on US highway, 1942 1 ton Ford pickup, new tires, in excellent condition. Plenty of work waiting. No competition. $15,000 plus a small stock (about $1,500) takes it. W. C. Pagel, Minot, N. D.

A new water well drilling machine capable of sinking 2″ to 8″ holes is now being manufactured at Burton Welding Mfg. Co. Write, wire, call, or see it. Phone 4-1483, Res. 4-7747. G-4456 So. Dort Hwy. Flint 7, Michigan.

1929 Keystone 5½ Joplin special. Mounted on semi-trailer with 34x7 dual tires. Wire line derrick and 4″ spud shafts with bushed sheaves. Waukesha power unit with V-belt drive. Rig was painted in June, is operating now but will be for sale early in October, with or without tools. Judd & Son, Shullsburg, Wis.

DRILLS FOR SALE

BUCYRUS-ERIE 36-L. THIS IS A NEW MACHINE, HAS RUN LESS THAN 400 HOURS. SEMI MOUNTED 9:00x20 TIRES. COMPLETELY EQUIPPED FOR BUTANE, NATURAL GAS & GASOLINE. CASING TACKLE STRUT & TOOL CRANE. WITH OR WITHOUT TOOLS & LINES & TRUCK PRICED RIGHT. WOULD CONSIDER TRADE FOR M-6 LUCEY MODEL ROTARY OR SIMILAR TRUCK MOUNTED PORTABLE THAT WILL HANDLE 3½″ OR LARGER DRILL PIPE. MORRISON DRILLING CO., BOX 87, HANOVER, NEW MEXICO. PHONE — SILVER CITY 043J1.

All steel machine, similar to Bucyrus-Armstrong 33-W, with shock absorber. Mounted on '36 Chev. 1½ ton truck with new rubber, good cab; mechanically perfect. Fully equipped for 3¼ and 4¼ wells. 1200′ of casing with machine. Also '46 Studebaker pick-up truck; perfect; low mileage. Both have to be seen to be appreciated. These are not black market deals. S. R. Jonas, Box 115, Randolph, Nebraska

Bucyrus-Erie 36-L spudder. Semi-trailer mounted, gas powered, equipped with casing tackle strut and auxiliary A frame leg. 2000′ of 8″ drill line and sand line. Complete drilling tools for 8″, 10″ and 12″ hole. Machine in excellent condition. Without tools, $12,500. With tools, $15,000. Price F.O.B. Tucson, Arizona. R. H. Wininger, 2649 Oracle Road, Tucson, Arizona, Phone — 0340-R3.

Sanderson-Cyclone No. 44 air speed spudder mounted on truck. Machine purchased new 1941. Derrick 34′ high. Gasoline engine. Price less tools and cable $3000. R. F. Dunbar & Sons, Delta, Ohio.

(Bargain Counter Continued on page 26)

DRILLS FOR SALE

New Bucyrus-Erie 22-W drill. Also a 4-wheel drive '41 Chev. motor army truck. 2 strings of tools, 6" - 8". Frank Acker, Hales Corners, Wis.

Model 16 Ideco all steel well drill; trailer mounted. Less than 1 year old. Complete set 6" tools. Complete set 5" tools. 1300' ¾" drilling cable, new. 1500' ⅝" sand line. Phone during business hours: Main 2538, El Paso, Texas, or write E. Ross, Station A, Box 3095, El Paso, Texas.

New No. 50 Keystone well drilling machine with bits, wrenches, and rope socket. Reasonably priced. J. G. Stone, Soddy, Tennessee

New Cyclone 44 oil field rig, on Diamond T truck. 1200' ¾" drill line, 1300' ½" sand line, 250' ⅝" casing line, blower, tool guide, cathead. Used one week. $6000. W. Moyle, 13151 Cheyene, Detroit 27, Mich.

DRILLS FOR SALE

One Howell No. 220 special all steel drill rig. Will handle up to 3000 lbs. tools. Will sell with all equipment ready to go to work. Machine can be seen in operation, and is in excellent condition. Box 197

One new 33-W well drilling machine, mounted on a truck. Complete with new tools and cable. Edward Pluter, R. 1, Manistee, Mich. Phone 1345.

MISC. FOR SALE

1 — 4 cylinder 20 H. P. Le Roi power unit.
1 — 4 cylinder 25 H. P. Le Roi power unit.
Both in perfect condition. Suitable for use on drilling machines. Price $250 each. Hoeg & Ames, Lincoln, Iowa.

New, never used B-E 10" casing puller ring with 1 set slips for 8" pipe—$100; 3 new steel drive shoes for 8" pipe. W. C. Pagel, Minot, N. D.

HELP WANTED

Driller to run new well drilling machine, nearly all rock formation, must be able to sharpen bits. Work out of Duluth. If you are an habitual drinker do not apply. Write: Ray L. Lacey, 4505 W. Superior St., Duluth, Minn.

Driller experienced in glacial drift formation. Contact Box 174, Viscount, Sask., Canada.

Smart driller for steady work in New England. High pay and living quarters for right man. New modern machines. Box 190

POSITIONS WANTED

Driller and tool dresser with long experience in cable tool drilling wants work in British Isles or Continental Europe. Box 196

FITLER
MANILA Drilling Cable

Especially designed with plenty of spring for water well and blast drilling — also lubricated to minimize internal friction.

Insist on FITLER

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Don't Accept Substitutes

THE EDWIN H. FITLER CO.
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Manufacturers of Quality Rope Since 1804

Water System Firm Announces Changes

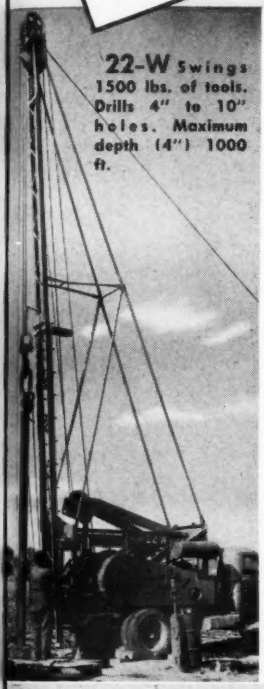
SEVERAL changes in the general organization of Sta-Rite Products, Inc., were announced recently by H. S. Lauterbach, President of the Delavan, Wisconsin, company.

Earl B. Nelson has been appointed General Manager of Sta-Rite, having formerly been Assistant General Manager. Mr. Lauterbach has assumed the duties of General Sales Manager, in addition to being President of the company. D. J. O'Neill has been named Sales Administrator.

The operations at Sta-Rite were also recently organized according to manufacturing divisions. Wilbur C. McClellan has been named Manager of the Water Softener and Water Heater Division, and George Wasson has been assigned as the Manager of the Industrial Pump Division.

THESE "NUMBERS" SPELL *Profit!*

21-W **22-W** **24-L**



22-W Swings 1500 lbs. of tools. Drills 4" to 10" holes. Maximum depth (4") 1000 ft.

Let the unexcelled hole production and work-horse stamina of Bucyrus-Erie water well drills — 21-W, 22-W, and 24-L — earn profits for you as they have for hundreds of other drilling contractors who already have firsthand knowledge of Bucyrus-Erie drilling performance and durability. Whether you handle the small four-inch jobs or do the heavier work requiring the use of up to 2400 pounds of tools — Bucyrus-Erie can match your needs with a drill capable of putting down your wells in the fastest, most profitable way. Why not do as an overwhelming majority of water well drillers have done — select the Bucyrus-Erie "number" that will add up to profits for YOU! 26W47C

24-L Swings up to 00 lbs. of tools. ls holes up to " diam. Maximum th (finishing 4" 5") 1500 ft.

Drilling and Fishing Tools

- Finest Workmanship
- A Complete Line
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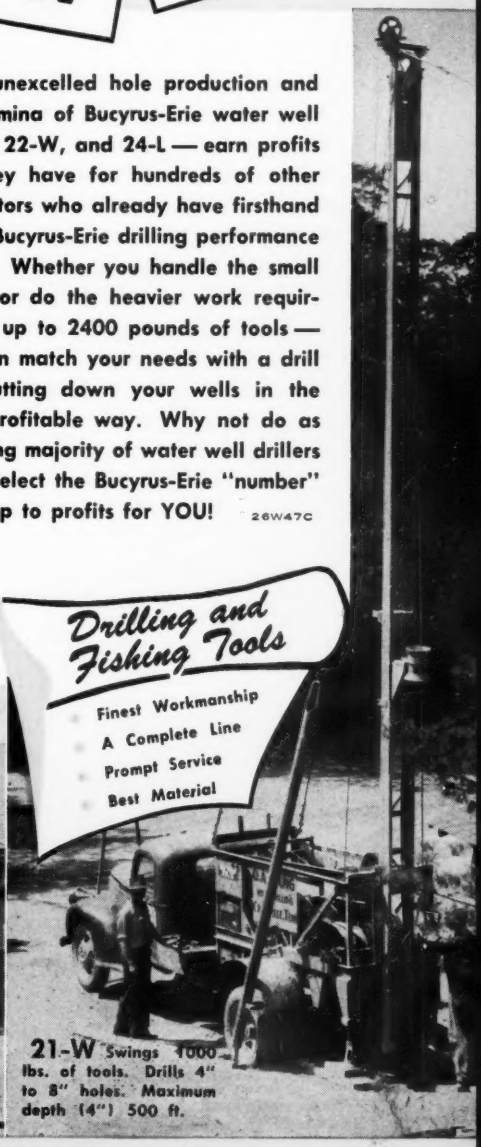

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